15¢
July 1, 1961
VOL. 80, NO. 1 PAGES 1-16

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

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MEDICINE

Future Nuclear Medicine

➤ THE AVERAGE person thinks of nuclear medicine in terms of its use for cancer treatment, but 95% of the present use of radioisotopes is directed in other ways, especially toward diagnosis.

Dr. John McAfee, associate professor of radiology and head of the radioisotope laboratory, Johns Hopkins University, told SCIENCE SERVICE that in his opinion nuclear medicine had reached a plateau in cancer therapy, and that its future lay in diagnosis.

"Cobalt teletherapy, for example," he said, "is an obviously accepted and valuable treatment, but it is difficult to see how it can be further improved."

This does not mean that research should stop, but Dr. McAfee said that to be useful in treatment chemical compounds are needed that "can be tagged with radioactive material that will concentrate in tumors to a high degree."

With the exception of a few thyroid carcinomas, the radiologist said, the treatment of cancer with radioisotopes has not been very effective.

There are three diagnostic uses of nuclear medicine that probably will be improved and widened in the future, according to Dr. McAfee. These are:

1. The use of radioactive iodine for the diagnosis of thyroid disease.

2. Blood volume determination, through either the injection of serum albumin labeled with radioactive iodine or red blood cells labeled with radioactive chromium.

3. Scintillation scanning, in which radioisotopes can be photographed as they localize in certain organs difficult to X-ray, such as the liver, kidneys, spleen and chest areas.

Dr. McAfee explained that "total body counting" is a new development in the diagnostic use of nuclear medicine.

"Up to now," he said, "we have been able to take out a portion of blood or urine and determine the amount of radioactivity in certain parts of the body. Now, detectors are being built in certain laboratories that show the amount of radioactivity in a patient's whole body.

"We all have a certain amount of radioactivity in our bodies, for example, radioactive potassium. Through the new detectors we can learn the total amount of potassium, whether radioactive or non-radioactive (stable)."

At the Society of Nuclear Medicine meeting in Pittsburgh, Dr. McAfee predicted that within the next decade radioactive isotopes in medicine will be used just as much as X-rays are today.

• Science News Letter, 80:2 July 1, 1961

PHYSIOLOGY

Drinking in Hungry Rats

➤ COMPULSIVE DRINKING is high among hungry rats rewarded with food at irregular intervals, studies have shown.

Dr. David Lester of the Laboratory of Applied Biodynamics and the Center of Alcohol Studies, Yale University, New Haven, Conn., said hungry rats trained to press a bar for the delivery of food pellets at uncertain intervals suffer anxiety-producing stress. With the increase of stress comes increase in the desire to drink.

The factors of bar pressing, presence of fluid during training, and predictableness of the food reward were seen as elements in the development of compulsive drinking.

Intoxication in nine male rats was produced in three-hour test sessions with blood alcohol levels reaching 0.2 percent. With variable food delivery, without bar pressing, the average consumption of alcohol solution was 2.0 grams an hour.

With bar pressing but food delivered at a fixed interval, the average consumption was 2.5 grams an hour. If water was not present during training, the average alcohol consumption with bar pressing and a variable food schedule was 3.2 grams an hour.

Dr. Lester states this method opens "the way to a host of experiments. The problem of tolerance, both metabolic and functional, appears simpler to approach by means of this technique."

The rats maintained themselves at blood alcohol levels of 0.11% to 0.19% for a period of 70 hours. When intoxication was thus maintained, increased alcohol intake on the third day was shown to produce a lower blood alcohol level, indicating the development of metabolic tolerance and other effects of prolonged intoxication, such as the withdrawal syndrome, Dr. Lester reports in the Quarterly Journal of Studies on Alcohol, 22:223, 1961.

• Science News Letter, 80:2 July 1, 1961

BIOLOGY

Wintergreen vs. Almond In Odor Penetration Test

➤ DIFFERENT CHEMICALS produce different odors because vibrations within the molecules are different.

This is the theory of Dr. R. H. Wright of the British Columbia Research Council in Vancouver, Canada. He compared nitrobenzene, which has an almond smell, and methyl salicylate, which smells like wintergreen. Both these substances are much alike so far as vibrations are concerned, except that wintergreen has two additional frequencies that are missing in nitrobenzene.

Taking into account the differing concentrations at which each smell could barely be detected, Dr. Wright predicted that it would be easier to detect wintergreen against a background of almond than vice versa.

In experiments with 12 volunteer sniffers, Dr. Wright showed that the wintergreen odor masked the almond smell about ten times more easily than almond masked wintergreen.

The effect is not large, he reports in Nature, 190:1101, 1961, but it is distinct and in the direction predicted by the vibrational theory of odor.

• Science News Letter, 80:2 July 1, 1961

PUBLIC HEALTH

Health Hazards in Uranium Mines Scored

➤ SERIOUS HEALTH HAZARDS in the nearly 1,000 active underground uranium mines in the western United States call for aggressive control measures, the U. S. Public Health Service, Washington, D. C., has urged.

Lung cancer, heart disease, accidents and radiation exposure are among the serious hazards, the Public Health Service said.

It is believed that radioactive contamination in virtually all uranium mines can be controlled. However, individual study of the mines is needed to determine what means of control are applicable to each mine. Studies of 371 underground mines with 3,619 miners were made in 1959 to evaluate the extent of the radiation hazards. Examination of 1,802 samples taken of the mine atmosphere showed that more than 66% of the samples had concentrations from one to ten times the working level (level of radiation exposure thought to be safe over a working lifetime without causing biologic damage).

Continued investigations are being made to insure compliance with control recommendations. Control is considered a primary responsibility of the states, but upon request, various Federal Government agencies will provide assistance.

• Science News Letter, 80:2 July 1, 1961

DERMATOLOGY

Cosmetics Cause 15,000 Cases of Skin Injuries

➤ COSMETICS cause thousands of cases of skin injury each year, the U.S. Food and Drug Administration has determined.

In one recent year, 1958, for which information has just been compiled, dermatologists reported 15,000 cases of dermatitis caused by four types of cosmetics: nail lacquers, hair-waving lotions, hair dyes and lipsticks. Since only one out of three dermatologists sent questionnaires replied, there are probably many more injuries.

Deputy Commissioner John J. Harvey of FDA, talking to the Association of Food and Drug Officials of the United States, said that new laws are needed to protect the public and that cosmetics, as well as food and drugs, should be tested and subjected to standards contained in the hazardous substances labeling act.

• Science News Letter, 80:2 July 1, 1961

PUBLIC HEALTH

Teen-Age Pill Kicks

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Illegal drug peddlers are selling pep pills and sedative combinations to teen-agers. Criminal cases involving the drugs will be tried in Federal courts, Faye Marley reports.

➤ BOOTLEG DRUG PEDDLERS have a new racket in a repackaged combination of pep pills and sedatives, called "sets."

Two sedative pills followed by a pep pill, or "bennie," are said to act as a sex excitant, or aphrodisiac. Juvenile gangs are buying "sets" and sometimes following the pills with liquor to produce reportedly "grim results," with inhibitions disappearing.

Youth rioters at Ocean City, Md., last summer included gang members who habitually take the combination drugs, according to information received by Richard E. Williams, a district director of the Food and Drug Administration. The sedatives are secobarbital capsules and the pep pills are amphetamines, each sold legally only on prescription.

"Criminal cases have been filed in a Federal court," Mr. Williams told SCIENCE SERVICE, "in which several 'pushers' and at least one other person are suspected of involvement in the primary source of supply. The cases are pending, with two of the pushers in jail on other charges, and others out on bail."

Mr. Williams said this combination of pills in a "set" is probably being sold all over the country, but was believed first uncovered in Baltimore. The problem has become so acute, Mr. Williams said, that some teen-agers are shoplifting or stealing in other ways to get money to buy the pills, which sell for two to three dollars, or as much as the youngsters will pay.

Mr. Williams does not know how the drugs are originally procured, but bootleggers obviously are diverting the legitimately bottled pills and repackaging them in sets. They are put into envelopes for sale.

"We have no reason to suspect legitimate druggists of cooperating in this new method of preying on the morals of young people," Mr. Williams said. "Until the cases are heard in Federal court we cannot reveal any names for fear this would be prejudicial."

There are legitimate combinations of sedatives and mood-elevating pills used for psychiatric patients who need to relax. But they are properly balanced prescription drugs. Many drug companies manufacture both the kind of sedative used in "sets" and amphetamines.

• Science News Letter, 80:3 July 1, 1961

ZOOLOGY

Keeps Tabs on Animals

➤ THIMBLE-SIZED radio transmitters weighing less than an ounce have been developed for studying the comings and goings of wild animals. They also could be used to keep track of small children.

Codevelopers William Cochran of the University of Illinois and Rexford D. Lord Jr. of the Illinois State Natural History Survey demonstrated the transmitters to the American Sociey of Mammalogists in Urbana, Ill. A built-in battery in each transmitter keeps it going for as long as four months.

It can be attached to rabbits, raccoons, opossums, pheasants and mallard ducks with a simple, lightweight harness containing the transmitter's antenna. A direction-finding radio then traces the animal's movements day or night. On ground-moving animals the signal can be picked up from half a mile away. On ducks flying half a mile high it can be tracked for 60 miles.

Studies with the transmitter already have revealed that a rabbit wakes up about five o'clock in the afternoon and puts in a 14-hour night of feeding. Within a single night, a rabbit confines his feeding to a two-acre area. About seven o'clock in the morning, the signal from the transmitter stops coming from different directions, and the scientist knows that the rabbit has hidden himself and gone to bed for the day.

Each transmitter operates on a different frequency so that scientists can keep track of several animals at one time. At present the signal is a steady tone, but Mr. Cochran plans to replace this with a beep tone, which can be used to relay information about the heart or respiration rates of the animal.

• Science News Letter, 80:3 July 1, 1961

PUBLIC HEALTH

Japanese Children Excel Iowans in Physical Tests

➤ JAPANESE BOYS and girls scored higher than taller, heavier Iowa youths in six out of seven physical fitness tests, a State University of Iowa study has shown. The children tested were nine to 12 years old.

Only in sit-ups did the Iowans excel. The Japanese students did better in pull-ups, bent-arm hang, the dash, forward bend, standing broad jump and shuttle run.

Two Japanese, Miss Namiko Ikeda, a candidate for the Ph.D. degree in women's physical education, and Dr. Tetsuo Neshizuka, who received his Ph.D. degree at State University of Iowa in 1956, cooperated in the study. Dr. Neshizuka, who is now teaching at Tokyo Metropolitan University, gave tests for Miss Ikeda to 395 Tokyo grade pupils from an area outside Tokyo, where farmers, fishermen and businessmen live.

Miss Ikeda tested 350 students in schools near Iowa City, and reported the combined tests in partial fulfillment of her degree. The Japanese pupils were in larger classes with less desirable facilities than the corresponding Iowa groups, but Miss Ikeda's study indicated that they had more chances to become active through physical education.

• Science News Letter, 80:3 July 1, 1961

WIRED RABBIT TO BE TRACKED BY RADIO

GENERAL SCIENCE

Science Office Proposed

➤ A REORGANIZATION PLAN creating a new Office of Science and Technology within the Executive Office of the President was recommended by staff members of the Senate Subcommittee on National Policy Machinery.

The new science unit would be headed by the President's special assistant for science and technology, a job now held by Dr. Jerome B. Wiesner.

The staff study calls for the plan to be submitted to Congress by next January. The present special assistant post and the Science Advisory Council, both created by President Eisenhower and continued by President Kennedy, would be made "permanent parts of the Government—with statutory underpinning."

The Office's formal responsibilities would include making continuing recommendations to the President for meeting long-term national needs in science, and helping the President and the Budget Bureau coordinate and evaluate agency programs for scientific research and development.

As Office director, the special assistant would be given "one, or preferably two, full-time deputies," drawn from Science Advisory Committee members and an expanded staff.

Also recommended was a strengthening of "science arrangements" in other departments and agencies, particularly the Department of State and the foreign aid agencies. State, the report said, lacks "a statisfactory level" of technical competence, and foreign aid agencies "have been tardy in taking advantage of the contributions which applied science and technology can make to their planning and operations."

A flexible mode of organization and operation is advocated for the new Office. "Science at the Presidential level must never become bureaucratized."

The subcommittee is headed by Sen. Henry M. Jackson (D.-Wash.) who said he personally agrees with the proposal.

• Science News Letter, 80:4 July 1, 1961

GENERAL SCIENCE

Loyalty Still Hot Issue

➤ SHOULD A COLLEGE student who accepts a Federal loan to further his education be required to file an affidavit proclaiming his anti-Communist sympathies and his loyalty to this country?

The question has been hotly debated since 1958, when the National Defense Education Act was passed by Congress. Currently, it is hotter than ever, as the time nears for the House Committee on Education and Labor, headed by Rep. Adam Clayton Powell (D.-N.Y.), to report on proposed amendments to the act.

Outright repeal of the so-called "disclaimer affidavit" provision in the present law is included in the Administration-backed omnibus bill introduced by Rep. Cleveland M. Bailey (D.-W. Va.). It is also the subject of separate bills offered by Reps. Edith Green (D.-Ore.), Thomas L. Ashley (D.-Ohio), John V. Lindsay (R.-N.Y.) and Herbert Zelenko (D.-N.Y.).

These five legislators see eye to eye with officials of the 32 U.S. colleges and universities wanting no part of the loan program as long as the disclaimer affidavit is compulsory, and also with those of 62 other higher-learning institutions where strong objections have been raised.

The bill passed in September, 1958 (Public Law 864), set up a system of loans administered by participating colleges. The Government provides up to eight-ninths of the money, and the college the remainder. The low-interest loans are limited to $1,000 per academic year, repayable within 11 years after the student leaves school. Special consideration is given student applicants who want to teach, or who have shown superior abilities in science, mathematics, engineering or foreign languages.

The controversy stems from one of the tagged-on "miscellaneous provisions." It stipulates that no loans or payments can be made to students who fail to meet two requirements. They must file a disclaimer affidavit swearing they do not belong to, believe in, or support any organization advocating or teaching overthrow of the U.S. Government by violence or illegal methods. And they must take an oath of loyalty to the United States.

Although the two-part ruling is commonly referred to as the "loyalty oath" provision, it is the first part—the disclaimer affidavit section—that has aroused the most bitter opposition, and is now the target of educators and liberal legislators alike.

The financial aid branch of the Office of Education, Department of Health, Education and Welfare, reports that 20 institutions in ten states have dropped out of the loan program because of the affidavit requirement. Harvard University, Yale University, Sarah Lawrence College, Smith College, Vassar College and the University of Chicago are included.

Twelve others, ranging from Princeton University and Bryn Mawr College to the Illinois College of Chiropody and Foot Surgery, declined to take part in the program at all, also because of the affidavit.

Of these 32, 24 have filed or stated they would file applications for participation in the 1961-62 program—if the current drive for repeal is successful.

The presidents or governing boards of 62 more institutions in 24 states have registered official disapproval of the disclaimer idea, but continue in the loan program. Brown University, in Rhode Island, has indicated it will drop out in the next academic year unless the affidavit is no longer required.

The general anti-disclaimer argument is that the requirement infringes on academic freedom and individual freedom of belief.

Others, including former Health, Education and Welfare Secretary Arthur S. Flemming, have pointed out that the clause is essentially useless, since no real Communist would have any scruples about lying and signing the affidavit to get what he wanted.

Also frequently mentioned is the allegation that students are unjustly singled out as "suspicious characters."

Appropriations originally authorized for the loan program totaled $47,500,000 for fiscal 1959, $75,000,000 for fiscal 1960, $82,500,000 for fiscal 1961, and $90,000,000 for fiscal 1962. No institution can receive more than $250,000 in any single year.

• Science News Letter, 80:4 July 1, 1961

SCIENCE NEWS LETTER
VOL. 80 JULY 1, 1961 NO. 1

Edited by WATSON DAVIS

The Weekly Summary of Current Science published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N.W., Washington 6, D. C., NOrth 7-2255. Cable Address: SCIENSERVC.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; ten or more copies in one package to one address, 7½ cents per copy per week; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is addressed. Your new address should include postal zone number if you have one.

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Printed in U.S.A. Second class postage paid at Washington, D. C. Established in mimeograph form March 13, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index. Member Audit Bureau of Circulation.

SCIENCE SERVICE

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EDUCATION

Study Science at Six

➤ THE INHERENT curiosity of children is the key to teaching them basic science for understanding the universe and later probing it. A group of University of California scientists and educators urgently believe that science can and should be taught to children at ages as young as six years.

By using a child's natural tendency to approach the physical world directly, scientists and teachers can guide children to methods of scientific and critical observations and habits of thought useful throughout life—whether or not they become scientists.

Recognition of these facts caused the launching of a constructive program at the University at Berkeley, the Elementary School Science Project, started in July, 1959, by four members of the University staff: Dr. Robert Karplus, physicist, whose thoughtful observation of his own youngsters in elementary school first sparked the idea; Dr. Leo Brewer, chemist; Dr. Arthur B. Pardee, biochemist; and Dr. Lloyd F. Scott, educator.

With a starting grant of $43,000 from the National Science Foundation, the program today includes a staff of University professors of mathematics, physics, physiology, chemistry, zoology, biochemistry, botany, and education—as well as research assistants, advisers, and teachers from four "laboratory" public schools in the University area. The project is expected to be in the testing stage for at least five more years.

In the experimental classes, conducted in regular classrooms during school hours, children in grades one to six are being taught to form sound scientific concepts on such weighty subjects as atomic structure, evolution and force. To them, Newton's Third Law, "to every action there is always an equal and opposite reaction," becomes basically comprehended by hooking their index fingers and pulling, or by carefully feeling the force in pushing their toy cars.

Natural selection as a mechanism of evolution, and the effect of camouflage gain significance as children pretend to be birds finding toothpick "caterpillars" hidden on the school lawn or in piles of excelsior, and tabulate and analyze their results. Or functional relationships are graphed on the blackboard as heights of corn seedlings are plotted against time.

Children seem to prefer a direct approach to science subject matter, observed Dr. Robert C. Stebbins, professor of zoology and present chairman of the project. "We have tended to stress where possible, therefore, actual manipulation and direct sense experience through touch, sight, taste, hearing," he said.

The time to introduce science is while children are most open-minded and interested, Dr. Stebbins pointed out. Later, they begin to conform to culture patterns and accept things written in books or stated by other persons instead of finding it out for themselves.

Dr. Stebbins said that there is an undefined period in the growth of children in our present cultural context when many seem to lose their sense of curiosity about the natural world. They are no longer as interested in insects, birds, rocks, stars as they were before—perhaps because they have entered the practical world of applied science and must find a place in a technologically oriented society.

In some school systems, educators wait until high school or college before introducing scientific studies, at a time when cultural indoctrination is well advanced and interest in basic science as yet is little nurtured.

One major problem is to prepare the material so that the teachers can use it, pointed out Dr. Stebbins. The average elementary school teacher today is not broadly trained in basic sciences, and it is not known at this time what steps should be taken to improve the teachers' science training.

"One of our objectives is to find out by experimentation what can and should be taught," he said. Thus the material is being written in considerable detail, and adapted for existing framework at all elementary levels. To supplement the manual, equipment such as clay fish, plastic atom balls, scales, graph paper are supplied by the project staff.

At present there are five courses, called units, being tested and revised: force, coordinates, physiology, animal coloration and chemistry. These units have been composed by Dr. Karplus in physics; Dr. Pardee in biochemistry: Dr. Nello Pace in physiology; Dr. Stebbins in zoology; Dr. Stephen Diliberto in mathematics; and Dr. Chester O'Konski in chemistry.

• Science News Letter, 80:5 July 1, 1961

UNDER ICE—Under the ice cap 700 miles from the North Pole in northwest Greenland, shuttle cars pick up loads of ice from area where a mechanical miner is digging a large excavation for year-round storage of materiel and housing of personnel in the Arctic. The shuttle cars run on batteries of a type invented by Edison, made by The Electric Storage Battery Company, Philadelphia.

GENERAL SCIENCE

Less Red Tape for Soviet Scientists

➤ SOVIET SCIENTISTS are far less burdened with administrative red tape than ours, an American sociologist claims.

Dr. Norman Kaplan, director of Research Organization Study at Cornell University, Ithaca, N. Y., reported that administrators in Soviet research institutes occupy less important positions than their American counterparts, and have "few if any decision-making responsibilities."

This leaves research directors and other top scientists in Soviet organizations free to make and execute their own administrative decisions on research policies, he said.

Dr. Kaplan, who visited the Soviet Union under a National Institutes of Health grant, said the country's standardized system of salary schedules and employment categories probably helps simplify institutional administration. Another factor is the high status enjoyed by Soviet scientists, who are almost equal in prestige to the highest-ranking Governmental officials.

Dr. Kaplan said a re-examination of large-scale United States research organizations may disclose that many current administrative practices are largely superfluous. Most U. S. scientists, he pointed out, are responsible to laymen who outrank them socially and financially.

• Science News Letter, 80:5 July 1, 1961

AERIAL LANDING LIGHT SYSTEM AT LA GUARDIA

TECHNOLOGY

Men Are Louder on Phone

➤ NOW IT IS OFFICIAL. Men talk louder than women during a telephone call, but women make the most social calls.

Although some members of both sexes will loudly dispute these facts, Bell Telephone Laboratories, Murray Hill, N. J., has statistics to back them up. In a survey of 10,000 phone calls made in 10 cities, the following facts came to light:

Males talk the loudest, but there is a wide variation in their volume depending on whether a member of the gentle sex is on the other end of the line, or if the call is purely social or business.

When the boss is not looking, not all interoffice calls are strictly business. Sixty-six percent of the interoffice calls were social, the survey showed.

Callers in New York also talked the loudest of the 10 cities surveyed, Kathryn L. McAdoo of Bell Telephone Laboratories told the American Institute of Electrical Engineers meeting in Ithaca, N. Y.

• Science News Letter, 80:6 July 1, 1961

Push-Button Telephone

➤ THE FAMILIAR telephone dial may soon be pushed aside by push-buttons.

Japanese scientists have installed an experimental transistorized push-button telephone sysem in a Tokyo department store to handle outside and intra-office calls. The system, which has been operating for more than a year, has improved service and will be used as a basis for future applications.

S. Yamato, K. Wantanabe, K. Muroga and J. Okuda of the Nippon Electric Company, Ltd., Tokyo, described the system to the American Institute of Electrical Engineers meeting in Ithaca, N. Y.

• Science News Letter, 80:6 July 1, 1961

TECHNOLOGY

Tap Niagara Falls

➤ THE LARGEST hydroelectric power project in the Western Hemisphere, and possibly the world, is being built in the shadows of Niagara Falls.

The huge power complex, which consists of two power plants, a reservoir and a high voltage transmission installation, will supply more than 3,000,000 horsepower or 2,190,000 kilowatts to area homes and industries. The $720,000,000-project will be completed by the end of next year.

One power plant, built on the Niagara River's edge three miles downstream from the Falls, will house 13 turbines, each of 200,000 horsepower. The other power plant will also pump water into the reservoir when it is not used to generate electricity.

The Niagara region, a favorite honeymoon spot for many years, is now also attracting industry because of the tremendous power waiting to be tapped from the river.

The Niagara project was described by T. E. Thorgerson of Charles T. Main, Inc., Boston, at the American Institute of Electrical Engineers meeting in Ithaca, N. Y.

• Science News Letter, 80:6 July 1, 1961

AERONAUTICS

New Runway Lights Installed at La Guardia

➤ INSTALLATION of a new lighting system, picked by the Federal Aviation Agency as a national standard, has been completed on a runway at La Guardia Airport in New York City.

The British-developed RAE (for Royal Aircraft Establishment) lights are designed to reduce the dangers of night landings or landings made under limited visibility. They can be seen for 15 miles at night and give pilots a visual means of flying down a predetermined glide path on final approach.

Twelve light units in three-unit bars are arranged with two bars on each side of the runway. Individual units are equipped with a high-beam white light and a low-beam red filter. If the pilot is too high, both rows of lights show white. If he is too low, they show red. If he is on the proper glide path, he sees the front row of lights as white and the back row as red.

Purchase and installation costs for both ends of the trial runway totaled about $80,000. Simplified versions at smaller airports would cost much less. FAA adopted the units after testing five different systems at the National Aviation Facilities Experimental Center, Atlantic City, N. J.

• Science News Letter, 80:6 July 1, 1961

GENERAL SCIENCE

Seattle in 1962 for National Science Fair

➤ THE 13TH NATIONAL Science Fair-International will be held May 2 to 5, 1962, at Seattle, Wash., in connection with that city's massive Century 21 exposition. The announcement was made by Watson Davis, director of SCIENCE SERVICE, which administers the annual fair.

The Seattle fair site is the Civic Auditorium, where the more than 400 youthful scientists expected to compete for awards will have approximately 38,000 square feet of floor space in which to set up their exhibits. The auditorium is in the 16-block area set aside for Century 21. Seattle's long-awaited "Space Age World's Fair" will open April 21 and continue through Oct. 21.

An exposition feature expected to be of particular interest to National Science Fair entrants and visitors is the U.S. Science Pavilion, which will house what is reportedly the largest science exhibit ever shown to the public. Built with Federal participation, the $9,000,000 structure is expected to be completed about Feb. 15.

The National Science Fair's Seattle planning committee, in charge of local arrangements, is headed by G. L. Hollingsworth, director of Boeing Scientific Research Laboratories there.

This year's fair was held at Kansas City, Mo., where the Science Fair Council and Science Service selected Philadelphia as the site of the 1964 event. Albuquerque, N.M., will play host to the 1963 fair.

• Science News Letter, 80:6 July 1, 1961

SPACE

Split Capsule to Mars

A space craft, based on present day technology, was described as capable of circling Mars and landing a capsule on the planet for collection of scientific data.

➤ A SPACE CRAFT reportedly capable of circling Mars and landing a detachable capsule on the planet's surface was described by C. R. Gates, chief of the systems analysis section at Jet Propulsion Laboratory, Pasadena, Calif.

Mr. Gates said the proposed "split capsule" craft, based entirely on existing technology, would be equipped to make scientific measurements of Mars directly from the parent vehicle, as well as retransmitting data gathered by the landing capsule.

The system he described at a joint meeting of the Institute of the Aerospace Sciences and the American Rocket Society in Los Angeles incorporates details of the Atlas-Centaur launch vehicle; the Ranger, a lunar spacecraft; and the Mariner A., a Venus spacecraft.

For the Mars probe, the 1,450-pound craft would propel itself by monopropellant hydrazine motors after separation from the launch vehicle. While the released capsule descended into the atmosphere of Mars by parachute, the parent craft would be accelerated laterally to avoid hitting the planet.

The blunt-nosed capsule would contain scientific instruments, batteries and a radio transmitter for one-way communications with the parent craft. The orbiting craft would have scanning instruments mounted on a boom, a directional antenna, electronic equipment and a large reflector for collecting solar energy to supply power after the craft's principal axis is pointed toward the sun.

The plan is based on research carried out by a California Institute of Technology study group under the sponsorship of the National Aeronautics and Space Administration.

• Science News Letter, 80:7 July 1, 1961

Air Force Uses Computers

➤ MAJOR ADVANCES in the use of computers as management aids are included in the new streamlined Air Force program for keeping up with developments in more than 100 weapons systems.

Lee A. Ohlinger, director of computing and data processing at the Northrop Corporation, Beverly Hills, Calif., said the program will give quick answers to questions at all management levels—from Headquarters Air Force through prime contractors to subcontractors. Previous delays caused confusion and lowered production and morale, he said.

Mr. Ohlinger described WSPACS—Weapons Systems Programming and Control System—as "a man-machine operation." Data supplied by contractors will be stored in computers. When reprogramming needs arise, the computers will determine if proposed changes are financially feasible. The machines will not make decisions, but will help management make them on a sound basis, Mr. Ohlinger emphasized.

"The day of intuitive management by 'seat-of-the-pants' technique is passing," he said. "If scientific management can be applied to industry, it should be equally capable of being applied to the military."

Mr. Ohlinger said the system will yield "intelligent and realistic decision-making based upon scientific principles." The Air Force study program utilized Operations Research teams from six major aircraft companies.

Mr. Ohlinger outlined the program at the joint meeting of the Institute of the Aerospace Sciences and the American Rocket Society in Los Angeles.

• Science News Letter, 80:7 July 1, 1961

AIR TRAILER—The Air Force's proposed 160-foot C-130A air trailer for carrying Saturn and other missile stages to launching sites is in the drawing board stage at Ling-Temco Electronics, Inc., Dallas, Tex.

TV From Outer Space

➤ TELEVISION announcers of the future may be telling viewers that "the following program is brought to you from outer space."

Putting television broadcasting transmitters in satellites was described as both technically and financially feasible. George M. Ives of the Ramo Wooldridge Laboratories, Canoga Park, Calif., speaking at a joint meeting of the Institute of Aerospace Studies and the American Rocket Society in Los Angeles, said programs originating on earth could be retransmitted via satellite over wide areas.

He said an 18,000-pound stationary satellite placed over the equator could beam programs to both North and South America. No booster capable of putting that large a satellite in orbit now exists. But the proposed Phoenix boosters will be designed to launch payloads even heavier.

Transmitting power would come from nuclear reactors or solar energy conversion systems.

Mr. Ives estimated annual cost of the proposed system at $12,100,000 annually. Almost half the earth's surface would be covered at a cost less than the $15,000,000 now spent annually for transmission and interconnecting facilities serving slightly more than half the people in the United States. The figure for a TV satellite, however, does not include development costs, "which will probably be high," he said.

• Science News Letter, 80:7 July 1, 1961

Clues to Origin of Life

➤ WHEN MAN REACHES the moon, clues to the origin of life may be discovered.

The moon, unlike the earth, is an object in which organic deposits may have been preserved unchanged, making it easier to determine their origin.

Speaking at a joint meeting of the Institute of the Aerospace Sciences and the American Rocket Society in Los Angeles, three scientists offered a plan for chemical analysis of the moon's surface through gas chromatography. Lunar samples would be converted to gas to disclose their chemical make-up.

They believe the results may help explain the evolutionary transition from non-living to living matter. A study program on the design of the necessary gas chromatograph apparatus is underway at the Jet Propulsion Laboratory, California Institute of Technology, Pasadena, where V. I. Oyama is a senior scientist. Stephen P. Vango does his research at the University of Chicago and E. Milton Wilson works at Aerojet-General Corporation, Azusa, Calif.

• Science News Letter, 80:7 July 1, 196[illegible]

GEOPHYSICS

World-Wide Study Of Earth's Crust

➤ WHILE SCIENTISTS are planning to dig deep into the solid heart of the earth, they are also very interested in other methods of studying what goes on from the earth's crust down to several thousand feet below the surface.

Paralleling the Mohole Project of piercing the earth's crust to the mantle some five miles down from the ocean floor will be a world-wide exploration of the crust and upper mantle. The so-called Upper Mantle Project will begin in 1962, with many nations cooperating, just as they did in the now famous and resultful International Geophysical Year.

The large-scale study will cover the continents and its margins, deep oceanic basins, submarine ridges and island arcs. Scientists hope to learn more about the forces and processes that shaped the earth throughout geologic history.

Scientists in the United States and Russia already have been working on many of these problems for many years, but the interpretations of the results have varied widely.

"The Upper Mantle Project will stress the coordination of the various groups of scientists in various fields and the standardization of the methods used for the interpretation of observations," the International Union of Geodesy and Geophysics Chronicle reported. The union will act as the coordinating agency for the project.

• Science News Letter, 80:8 July 1, 1961

GENERAL SCIENCE

International Help For Developing Countries

➤ A PROGRAM of international cooperation in scientific research to help newly developing countries solve their technical and economic problems has been recommended at Stanford Research Institute, Menlo Park, Calif.

To get it underway, the Government is urged to set up an Office of Research and Development within the United States foreign aid program. Functions would include helping define research needs, studying developmental methods, and supporting long-term relationships between U. S. institutions and those in developing countries.

The proposal came from a group of more than 40 scientists, technologists and research administrators after many meetings at Stanford's International Industrial Development Center.

Five major approaches are suggested:

Adapt previously gained scientific and technological knowledge to meet specific needs of underdeveloped countries.

Do more research in social sciences and social technology with the aim of bettering techniques by which a "backward" country can transform itself into "a modern, science-using society."

Select fields where valuable advances seem feasible for each country—such as transportation, communication, power supply, medicine and farming. Then give strong support to basic and applied research necessary to speed advances.

Through education and research cultivation, help underdeveloped countries "build up their own local capacities in science and technology."

Work toward "long-term inter-institutional cooperation" between advanced countries and developing countries, involving "a network of relationships among research organizations."

• Science News Letter, 80:8 July 1, 1961

SPACE

Study Earth Bacteria For Space Survival Clue

➤ THE STUDY of six different kinds of earth bacteria under artificial space conditions may give important clues to future space travel.

Such studies could give information about the behavior of cells, basic building blocks of all living things.

Single cells, adjusted to earth conditions, reproduce by splitting. Scientists need to know if the cells will split in the same manner in space or divide in some other, unknown way.

The bacteria will be tested in a dried state in an ultra-high vacuum like that found at orbiting altitudes 500 miles above the earth's surface. They will also be irradiated with ultraviolet light at wavelengths down to 2,000 angstroms or less to simulate radiation in space.

Further studies at the National Research Corporation, Cambridge, Mass., for the National Aeronautics and Space Administration are expected to include particle bombardment, ionizing irradiation and the effect of mutation on survival of the bacteria.

• Science News Letter, 80:8 July 1, 1961

PSYCHOLOGY

Mental Health Problems Affect Reading Skill

➤ IF JOHNNY cannot read, the fault may not be with his teacher or the method by which he was taught—whether the phonics method or the "see and say." He may be having difficulty with his mental health, Dr. Franklin H. Goldberg of the New York University Reading Institute reported to the Eastern Psychological Association in Philadelphia.

Dr. Goldberg studied 32 boys who were from one to four years retarded in their school work. The boys were not all stupid, Dr. Goldberg found. Although some were "dull-normal," some were superior in intelligence. Most of the boys were of average intelligence. Of the boys studied, 18 were found to have mental health difficulties.

Dr. Goldberg studied the personality characteristics of these retarded boys. The typical retarded reader, he found, is an immature, frightened and unhappy boy who does not enter actively into relationships with boys his age because of deep-seated feelings of inadequacy and failure.

• Science News Letter, 80:8 July 1, 1961

IN SCIEN

ZOOLOGY

Peanut Butter Worse Than No Mouse Bait

➤ PEANUT BUTTER is no good as mouse bait. It may even be a repellent, for it catches far fewer mice than no bait at all.

Dr. Kyle Barbehenn of the National Institutes of Health Animal Farm in Gaithersburg, Md., told the American Society of Mammalogists in Urbana, Ill., that he had discovered this while taking a long look at the scientific method for catching a mouse.

He studied the meadow mouse *Microtus pennsylvanicus*, a chestnut-colored animal with silvery white belly, small eyes, short tail and ears so small they are hidden in the fur. These little rodents are plant eaters and have the peculiar habit of building runways or trails in the grass. Although the runways are only one mouse wide, they serve as super highways.

The meadow mouse does most of its foraging, Dr. Barbehenn believes, in the fields adjacent to the runways and probably is fairly cautious there. But on the runways, he suspected, the mice go speeding along like a driver in a hurry and are likely to run into anything, including a trap. He also wanted to test if peanut butter is the irresistible lure for small mammals it is supposed to be.

He set conventional mouse traps in the runways and in the forage fields. Some were baited with peanut butter and some were unbaited.

For the most part Dr. Barbehenn's theories were right. The baited traps in the runways caught 47 mice while the unbaited traps caught 73. Baited traps off the runway caught 12 mice and the unbaited ones got 37.

If the peanut butter is not actually a repellent, Dr. Barbehenn said, it is at least a dead giveaway as to where the trap is.

• Science News Letter, 80:8 July 1, 1961

METEOROLOGY

Develop Instrument for Measuring Evaporation

➤ AN INSTRUMENT for accurately measuring evaporation from mountains, lakes or fields has been developed by Australian scientists.

Sensitive elements in the sophisticated instrument measure the wind, temperature, humidity and air density, and a tiny computer comes up with the correct evaporation rate, Dr. A. J. Dyer of the Australian Commonwealth Scientific and Industrial Research Organization told the American Meteorological Society meeting in Davis, Calif.

The small portable instrument known as the "Evapotron" has passed extensive field tests with flying colors.

• Science News Letter, 80:8 July 1, 1961

NE FIELDS

BIOLOGY

Scorpions Produce Sound By Banging on Ground

➤ TWO TYPES of scorpions in Israel have been found to produce sound in a unique way—by banging their midriffs on the ground.

All other scorpions known to produce sound do so by rubbing two body parts together. Some make a hissing noise by rubbing their chests with their pincers. Others produce a shrill grating sound by scratching their own backs with the tip of the tail.

Two subspecies of *Scorpio maurus,* however, made a "drumming" sound by curling the tail over the back and whacking the midriff section against the ground. In S. *maurus palmatus,* the yellow subspecies, each strike is accompanied by rapid body vibrations that do not hit the ground, and the net result is a series of thuds. In S. *maurus fuscus,* the brown subspecies, the noise is more like a rattle.

Drs. R. Rosin and A. Schulov of Hebrew University of Jerusalem report their findings in Science, 133:1918, 1961. They conclude that the drumming of these scorpions may be significant in fighting and hunting but probably not in courtship.

• Science News Letter, 80:9 July 1, 1961

MEDICINE

X-Rays Tell Injuries When Babies Cannot

➤ X-RAYS are being used to tell tales on parents who willfully injure their young children but try to cover up the real reason for the injuries, the Journal of the American Medical Association, 176:926, 1961, reports. Drs. John L. Gwinn, Kenneth W. Lewin and Herbert G. Peterson Jr. of the Department of Radiology, Children's Hospital, and the University of Southern California School of Medicine, state they found 25 cases of unsuspected injury among children under two.

Physicians in the country also read reports on:

Tranquilizer research. "Less than ten percent of published reports on tranquilizer and antidepressant drugs meet minimum standards of scientific acceptability," according to tests on 120 psychiatric patients at the New York Hospital, Westchester Division. The researchers got some very "unscientific" results from the use of two inactive agents, or placebos, which appeared to act as drugs. Many investigators do not accept the value of "controlled" procedures, which they call gilding the lily.—Drs. Armand W. Loranger, Curtis T. Prout and Mary Alice White, White Plains, N. Y. (p. 920).

Measles. The use of gamma globulin to modify or prevent measles is presently recommended only in children under two years of age or in those for whom measles constitutes a special risk, such as those with active tuberculosis.—Dr. John H. Dingle, Western Reserve University School of Medicine, Cleveland, Ohio (p. 972).

Nutrition. Exactly what foods do in the human digestive system is still not known. A broad investigative attack, "probably tedious but nonetheless essential," is needed to find out.—A committee of the AMA Council on Foods and Nutrition (p. 935).

• Science News Letter, 80:9 July 1, 1961

DERMATOLOGY

Sugar Doesn't Affect Acne But Chocolate Can Be Bad

➤ ACNE PATIENTS who eat sweets show no difference in results of treatment from those who are sharply restricted in the use of sugar. But chocolate is considered "offending," two Chicago physicians report.

Drs. Theodore Cornbleet and Irma Gigli divided 52 patients with severe acne into two groups. Both groups received antibiotics, but one group could have only two teaspoonsful of sugar a day in coffee or tea and could not have candy or cake or soft drinks containing sugar.

The researchers state they also compared the sugar tolerance of 15 acne patients with 15 who did not have the condition. The acne patients showed no evidence of sugar intolerance, they report in the Archives of Dermatology, June, 1961, published by the American Medical Association.

Although most dermatologists find chocolate "offending" in acne cases, the physicians said "questionable approaches" such as diet might be dispensed with until more solid evidence of their effectiveness is shown.

• Science News Letter, 80:9 July 1, 1961

RADIO ASTRONOMY

Additional Cause for Radio Waves From Space

➤ RADIO WAVES from space may stem from causes other than collisions of galaxies, the huge pinwheels of stars like the Milky Way in which the earth belongs.

Radio waves coming from distant clusters of galaxies are generally believed to result entirely from collisions. However, comparisons of such sources, as observed in Australia and England, suggested other factors to Dr. Sidney Van Den Bergh of David Dunlap Observatory, Toronto University, Richmond Hills, Canada.

He found that the number of radio sources in a cluster of galaxies was not the same as the number of galaxies in the cluster. A "poor" cluster with few galaxies might have as many radio sources as a "rich" one with many galaxies.

This suggests the possibility, he told the American Astronomical Society meeting in Nantucket, Mass., that other factors besides collisions cause the radio source.

• Science News Letter, 80:9 July 1, 1961

SURGERY

Patient Survives Surgery For Rare Heart Tumor

➤ A 37-YEAR-OLD auto salesman is the eighth known survivor of an operation for tumor (myxoma) of the right atrium, the upper right chamber of the heart. This type of operation has been successful since 1955.

Surgery took place at the Mayo Clinic, Rochester, Minn., after initial diagnosis at the Montefiore Hospital, Pittsburgh.

The patient had first been examined in 1955, but he returned twice in the next four years to Montefiore, showing progressive enlargement of the heart and an increase in the number of red corpuscles in his blood (polycythemia).

On removal the tumor was found to weigh more than half a pound and to measure more than three inches in diameter. Circulation outside the body was used during the operation.

Drs. Julian P. Levinson of Montefiore Hospital and Owings W. Kincaid of the Mayo Clinic report the operation in The New England Journal of Medicine, 264: 1187, 1961.

Angiocardiography (X-ray after injection of opaque fluid intravenously) provides the only positive means for preoperative diagnosis in cases of this kind, the researchers said. If the diagnosis is suspected, an angiography should "be performed without hesitation," they added.

In the case of the Pittsburgh salesman the additional problem of increased red blood cells may have been due to small blood clots from the lung, they believe.

• Science News Letter, 80:9 July 1, 1961

ASTRONOMY

Top Layer of Moon's Surface Resembles Sand

➤ THE TOP LAYER of the moon's surface is made of a material resembling sand and is only one-fifth of an inch deep.

Beneath this thin, sand-like film is a layer three or four inches deep that is a good conductor of electricity. Below this layer is another, of unknown depth, that resembles rock.

This three-layer picture of the moon's surface was drawn by Dr. J. E. Gibson of the U.S. Naval Research Laboratory, Washington, from observations made during a lunar eclipse. He focused a radio telescope on the moon to record changes in temperature occurring as the lunar surface was darkened by earth's shadow.

At a wavelength of a third of an inch, Dr. Gibson found, the lunar temperature did not change more than a degree during the total eclipse of March 13, 1960. At other wavelengths, considerably higher temperature changes have been found.

Dr. Gibson combined his result with previous information at these other wavelengths. This indicated the three-layer structure for the lunar surface, reported by Dr. Gibson in the Astrophysical Journal, 133:1072, 1961, published in collaboration with the American Astronomical Society.

• Science News Letter, 80:9 July 1, 1961

PUBLIC HEALTH

Air Pollution—a Growing Menace

Although air pollution causes more than $7.5 billion worth of damage each year, little action is taken against the irritating menace, Vincent Marteka reports.

➤ AIR POLLUTION is a growing menace in the United States, yet very little is being done about it.

Although scattered cries of protest are often heard throughout the country against this irritating and dangerous dirty air, no really strong nation-wide action to control this menace is in sight.

Air pollution causes $7.5 billion worth of damage each year in the United States. The smog-shrouded air stains buildings, rusts plants, kills livestock and is a general nuisance to people. Medical evidence strongly links polluted air with diseases such as lung cancer, asthma and other respiratory diseases, but more research is needed before a definite correlation is proved.

Because so little research has been done on air pollution, a curtain of mystery still surrounds the exact cause of pollution in various parts of the country. Some sources blame sulfur dioxide, formed when industries burn coal or liquid fuel, as a principal foe to clean air; others blame the hydrocarbons and carbon monoxide spewed out of automobile exhaust pipes.

Air Pollution Defined

Air pollution is an all-inclusive term, covering the entire scale of pollutants—smoke, dusts, mists, odors, gases such as carbon monoxide and even smog itself. Smog is now popularly defined as any air pollution noticeably objectionable to persons. On the West Coast it means watery eyes, blurred visibility and crop damage. In London and some other areas, it means extremely poor visibility, bronchial irritations and sometimes death.

The worst tragedies resulting from air pollution are attributed to the London-type smog. The most disastrous air-pollution attack occurred in London in 1952 when a heavy toll of 3,500 deaths were chalked up in a five-day battle for life against pollutants mixed with fog.

The first recorded deaths from air pollution were registered in 1930 when 63 persons died in the heavily industrialized Meuse Valley, Belgium.

This tragedy was followed by another in the coal mining town of Donora, Pa., where 20 deaths and countless illnesses were attributed to the siege.

Although air pollution is possible without smog, certain impurities must be present in the air to produce smog. Scientists generally agree that there are two principal ingredients from which smog is made: the unburned hydrocarbons sent into the air from automobiles, buses, and trucks; and the oxides of nitrogen, a product of nearly all burning fuels.

When these impurities are suspended in air in amounts averaging only one part per million, bright sunlight triggers a chain of reactions that regroup the molecules of exhaust gas to form smog.

Another undesirable product is ozone, a form of oxygen that smells like chlorine gas. The odor is sometimes noticeable during a thunderstorm when ozone is formed in the air by a bolt of lightning.

✓ Poor wind circulation as well as polluted particles is also needed in order to have air pollution. When persons are smoking in a smoke-filled crowded room with no ventilation the air becomes tolerable merely by opening a window or door. In nature where the barrier to good ventilation is mountains or deep basins, the problem is not so easily solved.

One of the worst natural ventilation problems is temperature inversion, an atmospheric quirk that traps polluted air over cities by an invisible lid. Air normally becomes cooler with altitude, but on inversion days, a layer of warm air hovers many hundreds of feet overhead. This prevents surface air, with its load of impurities, from rising and escaping. The bright and blazing sun then takes over, changing the trapped gases and particles to smog.

Since the natural action of sun and air are beyond the control of man, the impurities must be controlled at their source and not allowed to enter the atmosphere. A big battle against auto exhausts is now being waged in California where automobiles, according to state law, must have an anti-smog device by 1965. Actual testing of the devices is under way.

Anti-Smog Devices

The anti-smog devices fall essentially into two groups: afterburners and catalytic converters. Both are generally fastened to the exhaust pipe, replacing the muffler, although some are placed under the car's hood. The afterburners use spark plugs to burn the gaseous "garbage," whereas the converters use a catalyst to increase the temperature of the exhaust gases until they burst into flame.

Other cities with smog problems are developing a "wait-and-see" attitude. Smoggy Los Angeles and the California state government have, of necessity, been the leaders in air pollution research. California passed the nation's first state-wide anti-smog bill in 1960, and more than half of the non-Federal spending on smog research is done in the same state.

Although industrial fumes must share part of the blame for smog, a big reason

RISING SMOG—Smog covers Los Angeles about two out of every three days. Auto exhaust fumes and poor wind circulation are the chief culprits. From left to right, the clear air has turned into a smoggy blanket.

why the problem has grown steadily worse throughout the nation is the increased cluttering of vehicles on the road. More than 70,000,000 vehicles now ride on the United States streets and highways, compared to 50,000,000 just ten years ago. The figure will be pushed even higher in the future as more vehicles dirty the air in greater quantities.

Although California has the worst case of polluted air, the problem is cropping up more frequently than ever before in both cities and rural areas scattered across the United States. Flowering plants in parks of eastern cities are showing tell-tale signs of withering, and tobacco leaves on fertile farms in the Connecticut Valley are sometimes rotting from polluted air. Even the beautiful nation's capital does not escape the curtain of pollution, for a brownish haze is sometimes seen above the Washington skyline as hordes of commuters pour in and out of the city.

An accelerated program on both state and Federal levels is urged by public authorities and experts to fight air pollution before it gets completely out of hand.

Although some states have followed in California's footsteps by adopting legislation restricting air pollution, the national effort "is far from adequate for dealing effectively with the needs for air pollution control," V. G. MacKenzie, head of the air pollution division of the U. S. Public Health Service, charged.

"Virtually 90% of the U. S. urban population lives in localities having air pollution problems and the problem will get worse in the near future due to the mushrooming population," the scientist stated. The industrial output is also expected to double within the next ten years, which will produce a flood of new products and processes contributing indirectly to air pollution.

The PHS fight against air pollution is piling up impressive evidence linking air pollution with various diseases, but the evidence is still circumstantial, Mr. MacKenzie cautioned. The Public Health Service recently announced a unique plan to expose thousands of mice, guinea pigs and rabbits to the smog-enshrouded air that humans breathe along the Los Angeles freeways. The study should reveal quickly the effects of dirty air on health that would take decades to occur in human beings.

Although the Public Health Service and some states are fighting to control pollution with their limited funds, more money for research programs and more action on all levels of government are needed. The United States appears closer to putting a man on the moon than creating a healthy environment in which to live and breathe on earth.

• Science News Letter, 80:10 July 1, 1961

MEDICINE

Hormone Cancer Aid

➤ THE LONG-TERM search for male hormones useful in treating female cancer is seen helped by a discovery that oxygen is not necessary to the hormones' activity.

Natural male hormones have oxygen atoms attached to the carbon ring structures. Heretofore, scientists have believed oxygen to be necessary for male hormone effects.

The finding completely upsets prevailing theories, the American Cancer Society, which has been supporting the research, said. Drs. Albert Segaloff and R. Bruce Gabbard of the Alton Ochsner Medical Foundation in New Orleans succeeded in stripping the steroid skeleton of oxygen atoms and found to their surprise that the bare "bones" of the molecule still showed male hormone (androgen) effects.

Testosterone is a natural androgen, which has two oxygen atoms in the molecule. Relatively minor alterations—the addition or shifting of one or a few carbon, oxygen and hydrogen atoms—transforms the steroid skeleton into an amazing array of potent hormones with masculinizing, feminizing, stress-withstanding and other effects.

• Science News Letter, 80:11 July 1, 1961

TECHNOLOGY

Underground Network

➤ A REVOLUTIONARY underground communications network that sends messages deep within the earth even if the United States is under a nuclear bombardment is being developed.

Low frequency radio signals shot through a dense rock mass underlying the entire United States would be picked up by long underground antennas scattered in drill holes throughout the country. The deep natural radio "cable" is jam-proof and its messages cannot be detected at the surface.

The system is still in the experimental stage. Antennas could be placed as much as 100 miles apart although 50 miles is now thought more realistic. Antennas up to a mile in length would be lowered into a drill hole lined with a protective coating.

The dense granite rock mass generally ranging from 500 to several thousand feet below the earth's surface acts as a channel for low-frequency waves sent by a transmitter. The overlying layered rocks prevent any "burrowing" messages from being intercepted or jammed.

The system was originally pioneered by Gregory J. Harmon, an engineer at the Raytheon Company, Waltham, Mass. Other organizations are also currently conducting research in trying to push the project past the developmental stage. The unique underground system could prevent a repetition of the temporary weakening in the United States communications system that recently occurred in Nevada when communication installations were blown up.

• Science News Letter, 80:11 July 1, 1961

SPACE

U.S. Will Launch Canadian Satellite

➤ CANADA'S S-27 topside sounder satellite scheduled to be launched from Vandenberg Air Force Base, Calif., early in 1962 will be the first foreign satellite put up by the United States. The 280-pound satellite is designed to sound the ionosphere from an orbit 625 miles up. A prototype now is undergoing vibration and other tests.

The Canadian agency responsible for the project is the Defence Research Board in Ottawa working in close cooperation with the National Aeronautics and Space Administration. The launching vehicle will be a Thor-Agena B. rocket.

One feature of the satellite will be two antennas each 75 feet long and two others each 37½ feet long. They will be extended after the satellite is in orbit. Two 75-foot antennas will be tested in a four-stage Javelin rocket to be launched by NASA in June from Wallops Island. Purpose is to make sure that the antennas after uncoiling through specially-designed guides extend completely.

Dr. John Chapman of the Defence Research Telecommunications Establishment at Ottawa said the Canadian satellite will provide information leading to better worldwide communications and improved measurement of radar wave distortion in the ballistic missile early warning system.

Dr. Chapman said two satellites like the S-27 could carry out all the sounding of the ionosphere now being done by 140 ground stations around the world. He predicted this might be accomplished in five to ten years.

• Science News Letter, 80:11 July 1, 1961

ASTRONOMY

Artificial Moon Used To Study the Real One

➤ RUSSIAN scientists are using an artificial moon to learn more about the true moon's surface.

The strength of radio signals sent by the moon is compared with artificial signals of the land-based moon by alternately pointing a radio telescope at the moon and the disk, Prof. V. Troitskiy at the Yalta Observatory reports in a translation by the U.S. Joint Publications Research Service in Washington, D. C. The true intensity of the moon's signals can then be determined.

Radio signals tell scientists much about the moon's surface and its temperature. By finding out the true strength of the signals, scientists can be more exact about certain moon features such as thickness of the moon dust believed coating the surface.

• Science News Letter, 80:11 July 1, 1961

• Books of the Week •

For the editorial information of our readers, books received for review are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C.

ADVANCES IN PROTEIN CHEMISTRY, Vol. 15—C. B. Anfinsen, Jr., and others, Eds.—*Academic*, 447 p., illus., $13. Reports on protamines, osmotic pressure, protein malnutrition in man and other research.

ANIMAL PHYSIOLOGY—Knut Schmidt-Nielsen—*Prentice-Hall*, 118 p., illus., paper, $2.95; paper, $1.50. Comparative physiology, in the Foundations of Modern Biology Series.

ARMS CONTROL, DISARMAMENT AND NATIONAL SECURITY—Donald G. Brennan, Ed.—*Braziller*, 475 p., illus., $6. Collection of analyses of the technical, diplomatic, military, economic, legal and political issues involved in arms control, presenting diverse points of view as in the earlier versions in special issue of *Daedalus*.

BASIC CONCEPTS IN MODERN MATHEMATICS—John E. Hafstrom—*Addison-Wesley*, 195 p., $5.75. Terminal undergraduate course, treating in depth those fundamental concepts which lend themselves to the construction of number systems.

BASIC CONCEPTS OF PHYSICS—Arthur Beiser—*Addison-Wesley*, 341 p., illus., $5.75. One semester college course, assuming no prior knowledge of physics or chemistry.

CHEMICALS IN YOUR FOOD AND IN FARM PRODUCE: Their Harmful Effects—Franklin Bicknell, M.D.—*Emerson Bks*, 192 p., $2.95. Brings together information on noxious substances present in foods through naturally occurring poisons, accidental contamination, food additives and residues of agricultural poisons; 20-page bibliography included.

THE CRAFT OF TECHNICAL WRITING—Daniel Marder—*Macmillan*, 400 p., $5. Textbook on how to present technical subject matter effectively by applying rhetorical principles.

CURRENT RESEARCH AND DEVELOPMENT IN SCIENTIFIC DOCUMENTATION, No. 8—Madeline Berry Henderson and Nancy Ripple—*National Science Foundation (GPO)*, 153 p., paper, 65¢. Updated report describing U.S. and foreign research activities in the field.

EDUCATION FOR COLLEGE: Improving the High School Curriculum—Albert R. Kitzhaber, Robert M. Gorrell and Paul Roberts—*Ronald*, 195 p., $3.50. Contains chapter on science based on original report "Science in the Portland High Schools."

ELECTRICAL CONTACTS, 1960: Proceedings of Engineering Seminar—Ralph E. Armington, Chmn—*Pa. State Univ., College of Engineering*, 124 p., illus., paper, $5. Papers on static, arcing and sliding contacts, microcontacts and contact contamination.

ELECTRICAL ESTIMATING—Ray Ashley—*McGraw*, 3rd ed., 437 p., illus., $12.50. Up-to-date standard manual.

ELEMENTARY FLUID MECHANICS—John K. Vennard—*Wiley*, 4th ed., 570 p., illus., $7.95. Introductory course with emphasis on physical concepts rather than on mathematical manipulations.

EXPERIMENTAL ECOLOGY OF THE FEEDING OF FISHES—V. S. Ivlev, transl. from Russian by Douglas Scott—*Yale Univ. Press*, 302 p., $7.50. Summary of the results of investigations undertaken to establish experimentally the fundamental laws of the trophic ecology of fishes, of selective feeding, indirect food relations of fishes, and ecology of starvation.

FAST REACTORS—R. G. Palmer and A. Platt—*Temple (Simmons-Boardman)*, 93 p., illus., $2.95. Overall account of fast reactor technology.

FUNDAMENTAL MATHEMATICS—Thomas L. Wade and Howard E. Taylor—*McGraw*, 2nd ed., 428 p., $6.75. Course material designed to strengthen foundation for further study of mathematics and to provide basic mathematics for general education.

INFRARED PHYSICS: An International Research Journal, Vol. I, No. 1—W. K. Weihe and others, Eds.—*Pergamon*, 104 p., illus., paper, annual subscription: institutions, $20; individuals, $10. Publishes research papers, critical surveys and research notes.

INTERNATIONAL CONVERSION TABLES: Weights, Measures, Gauges, Currencies, Conversion Equivalents and Factors, Technical Units, Alphabets, Other Useful Information—Stephen Naft; rev. by Ralph De Sola—*Duell*, rev. ed., 372 p., $7.50. For ready reference in international commerce, industry and engineering.

INTRODUCTION TO LABORATORY CHEMISTRY—L. Earle Arnow, rev. with Marie C. D'Andrea Logan—*Mosby*, 6th ed., 124 p., illus., paper, $1.75. Variety of experiments to accompany introductory text on physiological and pathological chemistry.

INTRODUCTION TO PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY—L. Earle Arnow, rev. with Marie S. D'Andrea Logan—*Mosby*, 6th ed., 490 p., illus., $5.50. Updated textbook on the science of chemistry as it applies to nursing, with greatly expanded section on organic chemistry.

JET AND ROCKET PLANES THAT MADE HISTORY—David C. Cooke—*Putnam*, 72 p., photographs, $2.50. Describes and depicts history-making manned vehicles using jet and rocket principles.

MEASUREMENT AND EVALUATION IN PSYCHOLOGY AND EDUCATION—Robert L. Thorndike and Elizabeth Hagen—*Wiley*, 2nd rev. ed., 602 p., $7.25. Includes most recent developments in the field of testing in guidance or education, and fully explains the principles of reliability, validity, norms and interpretation.

METHODS OF CELESTIAL MECHANICS—Dirk Brouwer and Gerald M. Clemence—*Academic*, 598 p., $15.50. Designed to provide comprehensive background and reference to the motions of celestial bodies governed by gravitation. Presupposes working knowledge of differential and integral calculus.

MICROBIAL CELL WALLS—M. R. J. Salton—*Wiley*, 94 p., illus., $3.50. The 1960 CIBA lectures on the general properties, chemistry and biosynthesis of microbial walls.

MODERN ELEMENTARY ALGEBRA—Eugene D. Nichols and Wagner G. Collins—*Holt*, 402 p., $4.08. Ninth-grade textbook, stressing contemporary viewpoint on traditional topics.

NAME REACTIONS IN ORGANIC CHEMISTRY—Alexander R. Surrey—*Academic*, rev. 2nd ed., 278 p., $8. Concise data on 100 principal reactions, together with biographical sketches and references to literature.

NO LATITUDE FOR ERROR—Sir Edmund Hillary—*Dutton*, 255 p., photographs, $5.50. The leader of the first party to drive tractors to the South Pole tells in detail how the feat was accomplished.

ON RETRIEVAL SYSTEM THEORY—B. C. Vickery—*Butterworths*, 169 p., $5.75. Unified presentation of the different approaches to the problems of storage and retrieval of information, treating the subject on general theoretical lines.

OPTIMUM USE OF ENGINEERING TALENT: Meeting the Need for Technical Personnel—Jerome W. Blood, Ed.—*Am. Management Assn.*, 416 p., $9. Analysis of the management of engineers, proposing techniques for making optimum use of available engineering skills and talent.

ORTHOGONAL POLYNOMIALS: Estimates, Asymptomic Formulas, and Series of Polynomials Orthogonal on the Unit Circle and on an Interval—L. Ya. Geronimus, transl. from Russian—*Consultants*, 242 p., $9.75.

PALEOECOLOGIC MOLLUSCAN GEOGRAPHY OF THE CALIFORNIAN PLEISTOCENE—James W. Valentine—*Univ. of Calif. Press*, 327 p., illus., paper, $2.50. Study attempts to infer the climatic changes required to explain Californian Pleistocene molluscan distribution by determining their character over a broad area.

PETER FREUCHEN'S BOOK OF THE ESKIMOS—Dagmar Freuchen, Ed.—*World Pub. Co.*, 441 p., photographs, $7.50. About Eskimo life and customs, by the Danish explorer who lived among them and understood them well.

THE PHILOSOPHICAL IMPACT OF CONTEMPORARY PHYSICS—Milic Capek—*Van Nostrand*, 414 p., $7.50. Philosopher reviews the classical picture of the physical world, the disintegration of the classical framework and the significance of the new concepts in physics.

THE PHYSICAL THEORY OF TRANSISTORS—Leopoldo B. Valdes—*McGraw*, 370 p., illus., $10.50. Planned for a graduate course on the

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theory of diodes and transistors, with emphasis on the internal structure of these devices.

PLANNING SCHOOLS FOR NEW MEDIA—Amo de Bernardos and others—*Office of Education (Portland State College)*, 72 p., illus., $1. A guide to assist boards of education, school administrators and architects with the proper installation of electronic learning laboratories, reading accelerators, closed circuit TV and other modern media of instruction.

PROBLEMS AND WORKED SOLUTIONS IN VECTOR ANALYSIS (formerly titled: Introduction to Vector Analysis)—L. R. Shorter—*Dover*, 356 p., paper, $2. Unabridged reprint of 1931 edition.

PROCEEDINGS OF THE URANIUM CARBIDE MEETING, held at Oak Ridge National Laboratory, Dec. 1-2, 1960—R. C. Lied and others—*AEC (OTS)*, 162 p., illus., paper, $1.75. Summaries of papers.

PROGRAMMED INSTRUCTION, Vol. I, No. 1—Robert T. Filep, Ed.—*Center for Programed Instruction*, 8 p., illus., free upon request direct to publisher, 365 West End Ave., New York 24, N.Y. Reports on programing techniques, experience with programed instruction, recent research and workshops.

PROPOSED STUDIES ON THE IMPLICATIONS OF PEACEFUL SPACE ACTIVITIES FOR HUMAN AFFAIRS—Donald N. Michael, Ed.—*Brookings*, 272 p., paper, $1. Report prepared for NASA and printed for the use of the Committee on Science and Astronautics, U.S. House of Representatives, 87th Congress, first session.

PROSE BY PROFESSIONALS: The Inside Story of the Magazine Writer's Craft—Terry Morris, Ed., with Peter Farb and Mort Weisinger—*Doubleday*, 284 p., $3.95. Includes chapter on working with specialists in science and medicine.

PROTEIN BIOSYNTHESIS—R. J. C. Harris, Ed.—*Academic*, 405 p., illus., $14. Summaries and comments on papers of Symposium held in 1960 at Wassenaar, the Netherlands, under the auspices of UNESCO and the Council for International Organizations of Medical Sciences.

RADIOACTIVITY IN WATER SUPPLY AND WASTE WATER SYSTEMS: Peacetime Detection and Control—*U.S. Navy (OTS)*, 98 p., $2.25. Deals with the hazards of contamination of public water supplies, their detection and treatment.

RARE EARTH ALLOYS: A Critical Review of the Alloy Systems of the Rare Earth, Scandium and Yttrium Metals—Karl A. Gschneidner, Jr.—*Van Nostrand*, 449 p., $12.75. Deals with physical properties of pure rare earth metals, and treats in detail alloy systems involving rare earth metals as one or more of the components.

RESEARCH FINDINGS ON THE CHARACTERISTICS OF SCIENTISTS—Calvin W. Taylor—*Utah Engineering Experiment Station, Univ. of Utah*, 17 p., paper, 75¢. Summarizes and analyzes findings on the interrelationships of creativity, productivity, and promotions of scientific personnel.

ROCKET AIRCRAFT, USA—Erik Bergaust—*Putnam*, 48 p., illus., $2.50. Roundup for general reader of rocket planes, from the XS-1 to X-15 and the rocket glider Dyna-Soar.

SCIENCE AND MUSIC: From Tom-Tom to Hi-Fi— Melvin Berger and Frank Clark—*Whittlesey House*, 176 p., illus. by Gustav Schrotter, $3.75. Explores the world of musical instruments in terms of physics and chemistry.

SEEDS: The Yearbook of Agriculture, 1961—Alfred Stefferud, Ed.—*USDA (GPO)*, 591 p., illus., $2. Experts report in layman's language on the importance, life processes, production, processing, certification, testing and marketing of seeds.

A SHORT ACCOUNT OF THE HISTORY OF MATHEMATICS—W. W. Rouse Ball—*Dover*, 522 p., paper, $2. Unabridged reprint of author's last revised edition in 1908.

THE SLOW LEARNER IN SECONDARY SCHOOLS: Yearbook 1961—Stanton B. Langworthy, Chmn. —*N.J. Secondary School Teachers Assn.*, 100 p., illus., paper, $1. Teachers' study of the educational goals of 1,000 slow-learning students with I.Q.'s 75-89.

THE SOLAR SYSTEM—Patrick Moore—*Criterion Bks.*, rev. ed., 127 p., illus. by David A. Hardy, $3. Compact outline for young people.

SPEAK TO THE EARTH—William A. Breyfogle —*Macmillan*, 174 p., illus. by William J. Schaldach, $3.75. Collection of essays conveying the interrelatedness of all facets of nature.

SPECIAL CERAMICS: Proceedings of a Symposium held at the British Ceramic Research Association—P. Popper, Ed.—*Academic*, 369 p., illus., $10.50. Reports on progress in the study of new dielectric materials, mainly of the non-oxide type.

STRESS AND YOUR HEART—Fred Kerner, introd. by Hans Selye—*Hawthorn Bks.*, 237 p., $4.95. Explains current medical research on the effect of stress on the heart, in layman's language.

TEACHING AND LEARNING IN MEDICAL SCHOOL —George E. Miller, Ed.—*Harvard Univ. Press*, 304 p., $5.50. Study and evaluation of the objectives, techniques and programs of instruction in schools of medicine, sponsored by the Commonwealth Fund.

TELEVISION AND RADIO REPAIRING—John Markus—*McGraw*, 2nd ed., 568 p., illus., $8.95. Text and reference on radio and TV servicing.

TEXT-BOOK ON SPHERICAL ASTRONOMY—W. M. Smart—*Cambridge*, 4th ed., 430 p., paper, $3.95. Reprint of 1944 edition.

THE 20TH CENTURY AND YOUR HEART: Arteriosclerosis, Angina Pectoris, Coronary Thrombosis—Henry J. Speedby, M.D.—*Associated Booksellers*, 192 p., $4.50. Written by practicing physician to help patients understand the causes and methods of treatment of heart disease.

VITAMIN C—J. J. Burns, Ed.—*N.Y. Acad. of Sciences*, Annals, Vol. 92, Art. 1, 332 p., illus., paper, $4. Papers on recent progress in research on the origins, end products and functions of vitamin C.

YOUR GARDEN SOIL: How to Make the Most of It—R. Milton Carleton—*Van Nostrand*, 170 p., $3.95. A practical discussion of the qualities, ingredients and treatment of good garden soil.

• Science News Letter, 80:12 July 1, 1961

INVENTIONS

Patents of the Week

A remote-controlled underwater craft for ocean exploration has been patented. A faceted mirror to concentrate the sun's rays and a teaching machine were invented.

➤ A REMOTELY controlled underwater craft for exploring the ocean depths has been patented.

The vehicle is completely outfitted with a television camera for scanning sea life, sunken ships and ocean bottoms, a mechanical arm for assisting in salvage operations, and a propulsion unit for propelling the craft through the silent ocean depths. The craft was invented by Jack D. Robinson Jr. of Norwalk, Conn., who assigned rights of patent No. 2,987,893 to American Machine & Foundry Company.

The "seeing-eye" craft has two cigar-shaped pontoons with pressure compartments that are automatically flooded to balance the increasing pressures as the craft slides deeper into the murky depths. The pontoon's front tips house the mechanical arm and TV camera.

A propulsion unit hemmed in between the pontoons can either propel the craft in any direction or cause it to hover nearly motionless over one spot. A powerful beam of light from a floodlight mounted beneath the pontoons lights the way for the remotely controlled vehicle.

A huge many-faceted "mirror" that concentrates the sun's rays to supply high temperatures for research purposes won patent No. 2,987,961 for Eugene S. Cotton, Natick, and John M. Davies, Wayland, Mass., who assigned rights to the U.S. Army. A special instrument automatically tracking the sun reflects the solar rays in parallel beams upon the patented concave mirror which, in turn, concentrates the rays.

Each individual mirror or facet can be mass produced, whereas previously each mirror segment had to be hand tailored, the patent stated.

A teaching and testing machine for classrooms was patented by Harvard University psychologist, Dr. Burrhus F. Skinner, Cambridge, Mass., who assigned the rights of patent No. 2,987,828 to Rheem Manufacturing Company, New York City. The new machine requires little teacher supervision over the children and also avoids the use of the "multiple-choice" system commonly used in testing machines.

A question is presented to a student through a window while the answer contained in an adjacent window remains covered by a slat or mask until the student writes his answer on a paper tape sticking out of the machine. When the mask is pushed aside, the student's answer is covered by a window.

Farmlands can be fertilized with a device that squirts high-pressure jet streams of liquid fertilizer into the soil. The instrument was invented by Douglas Johnston, Huntsville, Ala., who assigned rights of patent No. 2,988,025 to John Blue Company, Inc., also of Huntsville. A "cutter" in front of the jet nozzle cuts the turf, and the high-pressured liquid fertilizer penetrates deep into the soil.

A boom-type sprinkler that uniformly irrigates large tracts of land despite wind gusts won patent No. 2,988,287 for Roger M. Sherman, Palo Alto, Calif., who assigned rights to W. R. Ames Company, Milpitas, Calif. Wind vanes riding the sprinkler system automatically keep the rotating boom arms at a constant angle with the ground, saturating the area in equal proportions.

• Science News Letter, 80:13 July 1, 1961

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GENERAL SCIENCE

News From Science Clubs

THREE FINE REPORTS from science-minded friends in the Philippines lead the current roundup of some of the interesting and provocative club activities disclosed to Science Clubs of America.

THE BENZENE RING Club of Zamboanga A.E. Colleges, Zamboanga City, won recognition for its cactus collection at that Philippine city's annual educational forum. A general program of land beautification also is included in the club's civic improvement activities.

AT TALAVERA, Nueva Ecija, the Philippines, members of the Talavera Provincial High School Science Club are pitching in to help make their community a better place to live. They are assisting in a program for propagating flowering plants, and visiting homes to aid in improving substandard sanitary facilities.

ALSO HELPING their community's people are students in the Rural School Biology Club at Bayawan, Negros Oriental, the Philippines. They are aiding in the immunization of swine and poultry, and in control programs for plant pests and diseases.

GROWING international flavor of science youth activities is reflected in a recent request from a secondary school in Tlaxcala, Mexico, and a prompt offer of cooperation from a United States science club. The Tlaxcala youngsters, trying to set up a science laboratory, told the United States Information Agency they needed equipment. USIA passed the word on to SCA.

FIRST TO RESPOND to the subsequent SCA appeal was the Onaway High School Science Club at Onaway, Mich. They promised to send "various types of equipment that we feel would be appropriate." At last report, they were ready to mail some Bunsen burners and hoses—but had to find out first if the Mexican school boasted any gas connections.

HOPE High School's club of Providence, R. I., undertook an ambitious spring project—sponsorship and organization of the first annual "RISSSCC," or Rhode Island Secondary Schools Science Club Convention. The one-day meeting, designed to bring club officers and faculty sponsors together for a beneficial exchange of ideas, featured group discussions followed by student reports to the entire assembly.

SCA, incidentally, encourages such workshop conferences on a city, county, regional or state basis—or even within an individual club. The national headquarters is ready and willing to help with necessary planning. Inquiries should be addressed to Miss Leslie V. Watkins, Executive Secretary, Science Clubs of America, 1719 N Street, N.W., Washington 6, D. C.

• Science News Letter, 80:14 July 1, 1961

TECHNOLOGY

Ultra-Modern Terminal With 5,000-Pound Roof

See Front Cover

➤ ABOVE GROUND LEVEL, the ultra-modern structure, seen on the cover of this week's SCIENCE NEWS LETTER, is made of one piece of concrete with a 5,000-pound roof.

The building of cantilever design, conceived by Saarinen and Associates, will be used as the air terminal for Trans World Airlines at Idlewild International Airport. The four concrete shells, forming its roof, are joined at a center plate.

The shells vary in thickness from eight inches at the edge to 44 at the center plate. Some 3,200 cubic yards of concrete were poured into the roof, which is 60 feet above the ground at its highest. Each roof-shell required counterforms to hold the concrete on the steep slopes after it was poured.

The Master Builders Company of Cleveland, Ohio, is among the firms working on the project, to be completed this year.

• Science News Letter, 80:14 July 1, 1961

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Questions

PUBLIC HEALTH—How many underground mines were studied for radioactive contamination? p. 2.

ZOOLOGY—How far away can a duck flying half a mile high be tracked with radio? p. 3.

Photographs: Cover, The Master Builders Company; p. 3, University of Illinois; p. 5, The Electric Storage Battery Company; p. 6, Sylvania Electric Products, Inc.; p. 7, Ling-Temco Electronics, Inc.; p. 10, U. S. Public Health Service; p. 16, E. R. Wagner Mfg. Co.

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PICNIC CARRY-ALL not only holds food for four persons but converts to a four-place dining table 14" high by 32" across, supported by four tubular steel fold-away legs. Its wood core is covered with washable plastic on both exterior and interior.

• Science News Letter, 80:16 July 1, 1961

COLOR-CODED PIPETS for easy identification in laboratories are marked by color bands according to their capacity and graduated interval. The capacity is also shown by a number in matching color above the band to assure quicker identification.

• Science News Letter, 80:16 July 1, 1961

SHAVING GEAR STAND neatly stores men's shaving equipment, whether they use electric shavers or safety razors. Available in rustproof aluminum, or aluminum with a transparent or colored plastic base, the stand easily fits into all modern medicine cabinets.

• Science News Letter, 80:16 July 1, 1961

ALL-PURPOSE APPLICATOR, shown in the photograph, is designed for use with various all-purpose liquid cleaners and can help clean woodwork, tile, windows and even white wall tires. The yellow plastic, 11½-inch handle holds a half pint of cleaner. A circular head combines a brush with polystyrene sponge into which the fluid is pumped by squeezing the handle.

• Science News Letter, 80:16 July 1, 1961

CORK PEGGED PLANKS, reflecting early American decor, are made in random widths and tones to achieve interesting decorative flooring effects. The 36-inch-long planks are available in light, medium and dark tones, with widths of four, six and eight inches.

• Science News Letter, 80:16 July 1, 1961

IDENTIFICATION LOCKETS give medical information about any special illness of the wearer and what to do in an emergency. Personal or medical history is contained on a slip inside the locket. Stainless steel or plastic lockets are available for use with a neck chain, pin or bracelet.

• Science News Letter, 80:16 July 1, 1961

ADJUSTABLE HEAD BAND gives cool relief during hot weather for up to five hours. Water is poured on an outside sponge-lined aluminum band and the evaporating water cools the band. Attractively designed, women can even wear it at the office or on the street.

• Science News Letter, 80:16 July 1, 1961

FLAMEPROOF WOOL BLANKET that snuffs out flames when clothing is afire is especially useful in chemical plants and laboratories, and other industries where fire is a hazard. The 62- by 82-inch blanket is packaged in a red metal case. A victim pulls a rope loop extending outside the case and as he revolves the blanket wraps tightly around him.

• Science News Letter, 80:16 July 1, 1961

Nature Ramblings

➤ THE BADGER has been given the nickname "doormat" because of his broad, squat form and his hairy back. But the badger is a courageous fighter, and in pioneer days it was considered great sport to turn a dog pack loose on this furry foe.

Although the contests were heavily weighted in favor of the dogs, few were willing to enter such a fight a second time.

If possible the badger hurriedly digs a protective hole, and if cornered will release a strong odor from glands near the tail. He is set low upon the ground, only about nine inches high at the shoulder; his throat is well below the line of attack of most dogs, and the back of his neck is too well armored in coarse hair to permit effective bites from above. His front claws are formidable weapons and he can leave a dog limping for life after one bite with his sharp teeth.

One dog, the dachshund (which translates literally as "badger-dog"), is almost as low slung as the badger itself, and can more easily get a deadly throat hold.

Badger

The popularity of badgering has decreased considerably, and the badger needs the respite. Throughout its normal range, the dry open country from central Saskatchewan southward to Mexico, the badger is not nearly so numerous as previously.

The badger lives alone, except during autumn mating and spring rearing periods. Usually it hunts for mice, gophers, ground squirrels, insects and snails at night, but occasionally it may be seen at the entrance of its den in the daytime.

• Science News Letter, 80:16 July 1, 1961

Do You Know?

Potassium deficiency may seriously alter the structure and function of the *heart*.

One of the first military applications of turbine-powered earth-moving and construction equipment is a gas turbine-powered *tractor* now being tested by Army engineers.

Nations in the Middle East are today cooperating to control the *locust*, the insect most often mentioned in the Bible.

In 1959, 26 states reported average production above 200 *eggs* per hen per year.

Alaska is now the only state in the U. S. immune to the attack of *termites*.

Asphalt shingle constitutes more than 80% of the roofing used on sloping *roofs* in the U. S.

Acids from mines kill *fish* by stopping blood circulating through the gills.

• Science News Letter, 80:16 July 1, 1961